The Effects of Chloroprocaine versus Lidocaine for Skin Infiltration Prior to Intravenous Cannulation

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4 June 2004

Significance of the Problem

- Most surgical patients require an intravenous catheter
- Pain free IV insertion will increase patient's confidence in our ability to perform anesthesia
- Decreasing anxiety and pain during IV insertion will help to obtund the catecholamine release

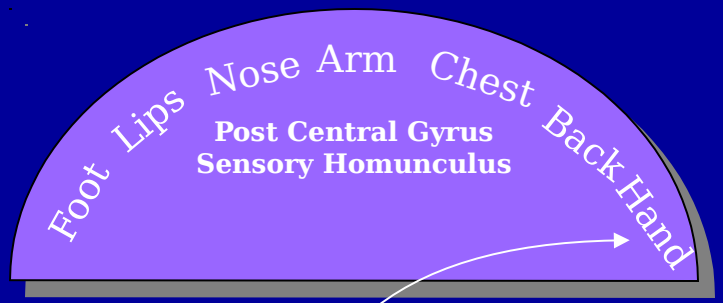
Purpose of the Study

- To identify which of the two local anesthetics, lidocaine or chloroprocaine provides better analgesia for intravenous cannulation

Theoretical Framework

- Pain pathway
  - Mechanism of pain perception
  - Types of pain
- Mechanism of action of local anesthetics
  - Block the nerve impulse transmission
  - Slow the rate of action potential depolarization

Pain Pathway (Spinothalamic Tract)
Mechanism of Action (Local Anesthet



Third Order Neuron

Thalamus

Within Spinothalamic Tract

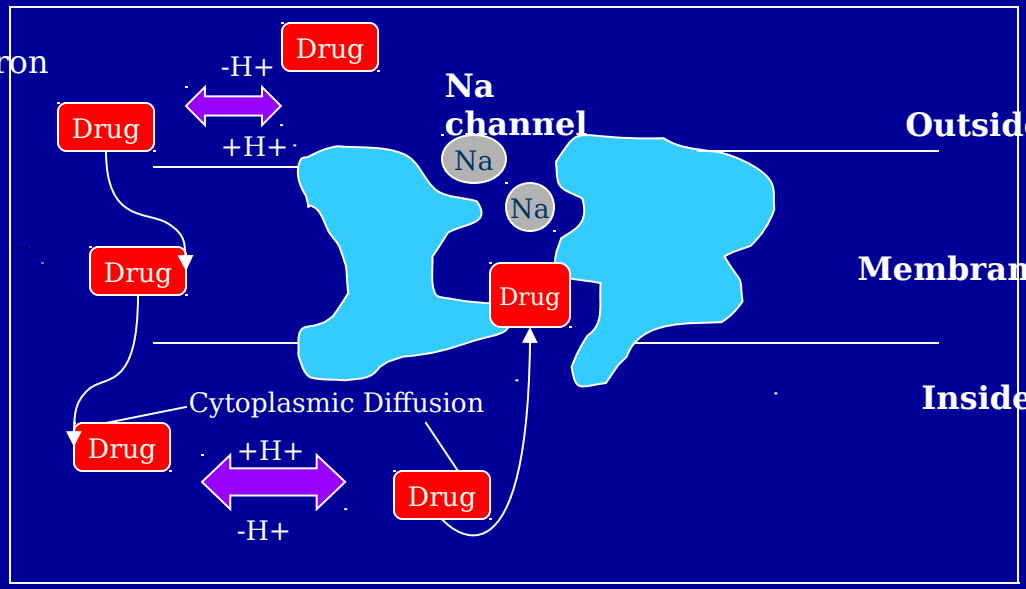
Second Order Neuron

Deccusation

Dorsal Horn
Spinal Column

First Order Neuron

From Periphery



Afferent nociceptor
Upper aspect of hand

Painful stimuli

IV Catheter Placement

Mechanism of Action

Local Anesthetic

Previous Studies

- Brown (2003)
  - Patients' preferences for local prior to IV insertion
- Morris & Whish (1984)
  - Procaine was best
- Marica et al. (2002)
  - Chloroprocaine was less painful than lidocaine
- Nuttall et al. (1993)
  - Alkalinized lidocaine was best

Hypothesis

There is no difference in perceived pain when using lidocaine versus chloroprocaine as a local anesthetic during skin infiltration for intravenous cannulation

Study Design

- Prospective
- Randomized, Double-blind
- Between/Within subjects
- Crossover design
  - Each participant will receive both treatments, one to each hand
  - Subjects serve as their own control

Statistical Analysis

- Delta score (change) from each set of scores
  - Left hand and Right hand
- Independent t-test to determine significant differences between groups

Power Analysis

$\forall \beta = 0.8$

$\forall \alpha = 0.05$

- Effect size 0.5 (medium)
- n=64 in each group (128 total)
- 64 participants
  - Each participant will be tested twice
  - Once on each hand

  Source: G-Power

Measurement Tool

- Visual Analog Scale (VAS) for pain
  - Reliability
  - Validity
- Gallagher, Bijur, Latimer, & Silver (2002)
    - R&V of VAS

Procedures

- LA injected intradermally to one hand
  - VAS scores taken
- 18 Gauge IV catheter inserted within 1 minute to same site
  - VAS score taken
- Procedure repeated on opposite hand
  - Hand used first alternated each subject
  - Medication used alternated and blinded from investigator

Sample

- Volunteers drawn from staff and students at AMEDD Center and School
- Healthy, consenting adults age 18 to 65
  - Based on inclusion/exclusion criteria

Questions